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Stuttering Treatment Outcomes Measurement: Assessing Above and Below the Surface

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Introduction

Most researchers now acknowledge that stuttering is a multidimensional disorder (Smith & Kelly, 1997). Therefore, any assessment of stuttering treatment requires a multifaceted approach. A multifaceted approach typically includes assessing both surface elements as well as elements of stuttering that exist "below the surface." Surface elements include aspects of the core behavior of stuttering such as stuttering frequency and stuttering moment durations. Elements that exist "below the surface" include symptomatic aspects of stuttering such as speaking avoidance, reduced social and occupational participation, and negative affective functioning in areas like locus of control, mood, and anxiety. Because there is often disagreement regarding the essential components of stuttering treatment there is also disagreement about appropriate treatment outcome measures (Blomgren, Roy, Callister, & Merrill, 2006a; Blomgren, Roy, Callister, & Merrill, 2006b; Reitzes & Snyder, 2006; Ryan, 2006). This article aims to summarize some of the issues of conducting a multidimensional appraisal of stuttering treatment.

Levels of Treatment Outcomes Measurement

The first step in any stuttering treatment outcomes assessment is determining the type of assessment to be conducted. Treatment outcome studies may be categorized into three levels depending on the type(s) of measurement used (Frattali, 1998; Olswang,

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1998). The most basic level is *treatment effectiveness research*. Treatment effectiveness research evaluates a clinical treatment primarily on the stated goals of the treatment. Treatment effectiveness studies report whether a treatment does what it advertises to do. Depending on the type of treatment (i.e., stuttering modification or fluency shaping), the measures used may differ considerably. The next level of assessment is *treatment outcomes research*. Treatment outcomes research evaluates clinically relevant outcomes of a normally prescribed (typical) treatment. More than simply evaluating stated goals, treatment outcome studies throw a broader evaluative net. Treatment outcomes research may measure both intended *and* unintended outcomes, (i.e., consequences) of a treatment. Typically treatment outcomes research involves areas of importance to those afflicted by a disorder, regardless of the actual, or stated, goals of the treatment. Finally, *treatment efficacy research* assesses the degree to which a treatment is helpful under experimental, or ideal, conditions. Treatment efficacy research is the most involved level of assessment and typically includes comparisons of different treatments and/or includes measurements of *treatment efficiency*. Measuring treatment efficiency is to examine dose-response relationships in treatment. In other words, treatment efficiency relates changes in the benefits of a treatment given different treatment durations. The gold standard of treatment efficacy research is the *prospective randomized clinical trial*. In this research paradigm, subjects are randomly assigned to two or more treatment (or non-treatment) conditions. In a stuttering outcomes assessment, the level of outcomes measurement should be transparent.

What to Measure and Why

The World Health Organization ([WHO] 2001) has advocated a multidimensional view of assessing illness. In its most recent model, the WHO replaced earlier concepts of

"disability" and "handicap" with the concepts of "impairment," "activity limitation," and "participation restrictions." This viewpoint is particularly relevant to the complex and multifaceted disorder of stuttering. The WHO model has been utilized for assessing both core, or surface, stuttering behavior (the "impairment") and the undesirable, or "below the surface" consequences of stuttering (the "activity limitations and participation restrictions") (e.g., American Speech-language-Hearing Association, 2001; Finn, Howard, & Kubala, 2005; Yaruss, 2001; Yaruss & Quesal, 2004). Any holistic assessment of the success of a stuttering treatment should use a multidimensional approach that includes both impairment *and* participation restrictions / activity limitations.

A treatment outcomes study will only be as good as the data collected. The first step in data collection is choosing appropriate measurement tools. Measurement tools that can be used to evaluate stuttering treatment are numerous. Decisions on which particular instruments to use will be driven by beliefs about the essential outcomes of stuttering treatment. Ultimately, measures should be chosen based on their ability to elucidate factors that are thought to be important outcomes of stuttering treatment.

Symptoms of stuttering have often been categorized into three types. Guitar (1998) lists three primary components of stuttering: core behaviors, secondary behaviors, and affective aspects of stuttering. Bennet (2006) has written about the ABCs of stuttering which include affective components, behavioral components, and cognitive components. Minimally, a comprehensive treatment outcomes study should provide adequate measurement on both the surface (behavioral) and subsurface (cognitive and affective) aspects of the disorder. Further, when appropriate, it is recommended to assess these constructs using multiple measures. When possible, these multiple measures should

include both observer-reported and self-reported data. Multiple measures can (a) provide the essential multidimensional analysis of stuttering treatment, (b) provide for an assessment of the convergent validity of the findings (i.e., the degree to which similar findings are obtained using different measures of the constructs), and (c) enhance the applicability of the results to the research of others (Blomgren, Roy, Callister, & Merrill, 2005).

Treatment Outcomes and *The University of Utah Intensive Stuttering Clinic*

At The University of Utah, we are currently collecting outcomes data on our ten-day fluency facilitation program, *The University of Utah Intensive Stuttering Clinic* (UUISC). The clinic involves approximately 65 hours of direct treatment. The clinic runs from 9 a.m. to 4:30 p.m., Monday through Friday, for two weeks. Therapy includes a combination of individual and group sessions. Each clinic typically comprises five to eight clients. This is an annual clinic and the fourth clinic was completed in August of 2007.

The UUISC is principally a prolonged speech / fluency shaping approach to stuttering treatment. The primary goal of the clinic is to have clients learn and apply speech motor techniques that facilitate fluent speech. These techniques include prolonged speech, gentle vocal onsets, and reduced articulatory pressure. Approximately 80% of the clinic time is devoted to fluency skill acquisition. The UUISC is based on the fluency shaping approach developed by Webster (1982). Additional fluency shaping influences come from Boberg and Kully (1985). The UUISC is also an example of an eclectic approach to stuttering treatment. In addition to fluency facilitation, stuttering modification techniques and issues related to stuttering management, stuttering acceptance, and social-communication skills building are addressed throughout the clinic.

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Specifically, these secondary goals of the clinic include stuttering management techniques such as disclosure of stuttering, managing speaking related anxiety, and techniques for terminating moments of stuttering when they occur. Some of the cognitive-behavioral and desensitization approaches were influenced by Breitenfeldt and Lorenz (1989), Kroll (1991), and Webster and Poulos (1989). The treatment manual is available through XanEdu Custom Publishing (Blomgren, 2005) or through the author (michael.blomgren@health.utah.edu).

We are currently analyzing the treatment outcomes data from the past four years of the clinic. To date, twenty-two people who stutter have attended the clinic. Preliminary group outcomes data suggests substantial decreases in stuttering frequency immediately post-treatment, with a mild regression of gains six months to two years post-treatment. While we are currently in the midst of these analyses, one clear observation is that the individual data are highly variable in respect to changes in the various outcome measurements. Additionally, some clients have been exceptional skill maintainers, while a small group has clearly struggled to maintain their immediate post-treatment gains. The following section provides an overview of the data we are collecting and the rationale for its inclusion. The list is not intended to serve as an exhaustive compilation, but is simply provided as one example of conducting a multidimensional stuttering treatment outcomes study. Our outcomes data on this fluency shaping program is similar to the battery we used in our published outcomes assessment of a stuttering modification program (Blomgren et al., 2005).

1. Assessment of Speech & Stuttering. Assessment of frequency and severity of stuttering is fundamental to any type of stuttering treatment outcomes study. The need

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to assess dimensions of the behavior that defines the disorder should be fairly self-evident.

a. Observer calculated stuttering frequency. Percentage of stuttered syllables is calculated during:
    i. Two reading passages
    ii. A five-minute monologue
    iii. Two out-of-clinic speaking situations.
b. Two self-assessed stuttering severity ratings. Clients are asked to self-assess their stuttering severity on an 8-point scale (0=no stuttering, 7=severe stuttering). Clients self-assess their stuttering immediately following a five-minute monologue and additionally provide an estimate of their perceived average stuttering severity over the past two weeks.
c. Average duration of three longest moments of stuttering calculated for each speaking situation.
d. Scores on the *Stuttering Severity Instrument for Children and Adults, Third Edition* (SSI-3; Riley, 1994).
e. Speech rate as a function of syllables per minute.
f. Articulation rate as a function of average fluent word durations in msec.
g. A speech naturalness rating scale (Martin, Haroldson, & Triden, 1984). This is a 9-point scale where raters judge a speech sample based on a gestalt notion of "natural" vs. "unnatural" speech production. Assessing speech naturalness is important because if post-treatment speech continues to be unnatural, it is probable that clients will discontinue fluency skill use.

2. Assessment of Secondary Stuttering Behaviors. Secondary, or concomitant, stuttering behaviors often present as much (or more) a part of the stuttering problem as the core behaviors. Appropriate evaluation of this aspect of stuttering provides for a considerably more complete evaluation of stuttering behavior than simple stuttering frequency counts.
    a. Measured via "physical concomitants" subscale score from the SSI-3
    b. Perceptions of Stuttering Inventory (PSI; Woolf, 1967). This 60-item inventory assesses three dimensions of stuttering: (a) self-assessed struggle to speak, (b) avoidance behaviors, including efforts to avoid both situations and words in which an individual anticipates stuttering and (c) expectancy of stuttering and expectations about one's ability to speak successfully.
3. Affective Measures. For many people who stutter, the disorder has innumerable psychological consequences. Assessment of the following areas may provide insight into positive affective changes arising from improved speech production and / or improved management of stuttering.
    a. Anxiety – Nearly every person who stutters reports feelings of increased anxiety when speaking, especially in situations involving strangers, groups, and the telephone. Measuring aspects of anxiety can be an important ancillary measure of treatment success. We measure anxiety using two scales:
        i. *Liebowitz Social Anxiety Scale* (Liebowitz, 1987). Nearly all of the 24 items on this scale relate to communication. Scores are obtained for both "fear or anxiety" and "avoidance."
        ii. The *Multi-Component Anxiety Inventory* (MCAI-IV; Schalling, Chronholm, Asberg, & Espmark, 1973). This scale divides the

assessment of anxiety into three subscales: Psychic/Cognitive Anxiety, Somatic Anxiety, and Muscular Tension. Previous research has indicated this scale to be a sensitive marker of stuttering treatment effectiveness (Blomgren et al., 2005).

b. Mood - Measured with the *Beck Depression Inventory* (BDI; Beck & Steer, 1993). The BDI was designed to reveal a general syndrome of depression, but has also been used for assessing subclinical changes in mood. It assumed (albeit unproven) that improved control over speech production may lead to positive changes in mood.

c. Feelings of control - Measured with the *Locus of Control of Behavior Scale* (LCB: Craig, Franklin, & Andrews, 1984). The LCB assesses the extent to which individuals perceive responsibility for their own problem behavior. Lower LCB scores indicate a more internal locus of control. Changes in locus of control have been reported to predict maintenance of therapeutic gains or relapse in stuttering therapy (Craig & Andrews, 1985).

4. Effect of Stuttering in Daily Situations and on Quality of Life in General. Measurement in this area allows for assessment of possible changes in "activity limitations," and "participation restrictions."

   a. The *Overall Assessment of the Speaker's Experience of Stuttering* (OASES; Yaruss & Quesal, 2006) includes assessment of a speaker's knowledge about their stuttering, reactions to their stuttering, level of difficulty communicating in daily situations, and impact of stuttering on quality of life, social relationships, and occupational status.

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The above list is an example of a relatively robust treatment outcomes collection strategy. Due to the large amount of time and effort involved in collecting and analyzing data of this magnitude, this particular "catch-all" strategy is most applicable to a funded research environment. It may well be possible to capture the essence of this larger outcomes study by using fewer measurement tools. For speech-language pathologists engaged in a busy clinical practice, a more succinct, more clinically "doable," strategy might be to collect both surface and subsurface treatment outcomes data using only three or four measurement tools. One "time friendly" example would be to collect pretreatment, posttreatment, and follow-up treatment data utilizing: (1) the SSI-3 (reporting stuttering frequency, the SSI-3 subscores, and the overall SSI-3 score), (2) the PSI (reporting the three struggle, avoidance, and expectancy subscores), (3) a client-reported stuttering severity measure, and perhaps (4) the OASES.

Conclusions

Obtaining valid and robust stuttering treatment outcomes takes planning and requires many decisions regarding appropriate outcome measurements. Those measures should always include an assessment of both the overt or surface aspects of stuttering *and* the important subsurface aspects of stuttering that often contribute to severity of the impairment. The practice of evidence-based stuttering therapy implies that we have collected data and have adequate proof of success to promote a particular treatment (Ingham, 2003; Onslow, 2003). It is an issue of "truth in advertising." Are we really providing the quality of service that we hope or believe we are? And, are the positive results that are often reported immediately following a stuttering treatment program durable? Long term follow-up data are also needed. It is imperative that the field of stuttering continue to evaluate its long held beliefs about stuttering treatment.

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